This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

Claims 1 - 330 (Cancelled)

331. (Previously presented) An analytical method comprising:

transmitting electromagnetic radiation through a first structure comprising a substantially transparent substrate carrying a plurality of metallic islands;

detecting the electromagnetic radiation transmitted through the first structure to generate a first measurement corresponding to a first surface plasmon intensity of the first structure;

forming a second structure by contacting the first structure by a substance;

transmitting electromagnetic radiation through the second structure, and detecting the electromagnetic radiation transmitted through the second structure to generate a second measurement corresponding to a second surface plasmon intensity of the second structure; and

sensing a presence or absence of binding of the substance to the first structure by utilizing the first and the second measurements to determine a change of intensity between the second surface plasmon intensity and the first surface plasmon intensity.

332. (Previously presented) The method of Claim 331, wherein the first structure further comprises an intermediate layer bound to the metallic islands.

333. (Previously presented) The method of Claim 331, wherein the metallic islands are made of Au or Ag.

334. (Previously presented) The method of Claim 331, wherein the electromagnetic radiation is in the UV, infrared or visible spectrum.

335. (Previously presented) The method of Claim 331, wherein the substance is a chemical substance.

336. (Previously presented) The method of Claim 331, wherein the substance is a biological substance.

337. (Previously presented) An analytical method comprising:

transmitting electromagnetic radiation through a first structure comprising a substantially transparent substrate, a plurality of metallic islands deposited onto the transparent structure, and a layer deposited onto the metallic islands;

detecting the electromagnetic radiation transmitted through the first structure to generate a first measurement corresponding to a first surface plasmon intensity of the first structure;

forming a second structure by contacting the first structure by a substance;

transmitting electromagnetic radiation through the second structure, and detecting the electromagnetic radiation transmitted through the second structure to generate a second measurement corresponding to a second surface plasmon intensity of the second structure; and

sensing a presence or absence of binding of the substance to the layer of the first structure by utilizing the first and the second measurements to determine a change of intensity between the second surface plasmon intensity and the first surface plasmon intensity.

338. (Previously presented) The method of Claim 337, wherein the layer is characterized by specific affinity to a ligand in the substance.

339. (Previously presented) The method of Claim 337, wherein the substance is in a liquid form.

340. (Previously presented) The method of Claim 337, wherein the substance is in a gaseous form.

341. (Previously presented) The method of Claim 337, wherein sensing the presence or absence of binding of the substance to the layer comprises contacting the first structure by a solution containing the substance.

342. (Previously presented) The method of Claim 337, wherein the first surface plasmon intensity and the second surface plasmon intensity are measured in the transmitted electromagnetic radiation of a single wavelength λ.

343. (Previously presented) An analytical method comprising:

transmitting electromagnetic radiation through a first structure comprising a substantially transparent substrate, a plurality of metallic islands deposited onto the transparent structure, and a layer deposited onto the metallic islands;

detecting the electromagnetic radiation transmitted through the first structure to generate a first measurement corresponding to a first surface plasmon intensity of the first structure;

forming a second structure by contacting the first structure by a phase comprising an analyte;

transmitting electromagnetic radiation through the second structure, and detecting the electromagnetic radiation transmitted through the second structure to generate a second measurement corresponding to a second surface plasmon intensity of the second structure; and

determining a concentration of the analyte in the phase by quantitatively monitoring binding of the analyte to the layer of the first structure by utilizing the first and the second measurements to determine a change of intensity between the second surface plasmon intensity and the first surface plasmon intensity.

344. (Previously presented) The method of Claim 343, further comprising utilizing determining the concentration of the analyte to monitor kinetics of a chemical reaction.

345. (Previously presented) The method of Claim 343, wherein the analyte comprises chemical of biological molecules.

346. (Previously presented) The method of Claim 343, wherein the metallic islands are made of Au or Ag.

347. (Previously presented) The method of Claim 343, wherein the electromagnetic radiation is in the UV, infrared or visible spectrum.

348. (Previously presented) The method of Claim 343, wherein the first surface plasmon intensity and the second surface plasmon intensity are measured in the transmitted electromagnetic radiation of a single wavelength λ.

349. (Previously presented) The method of Claim 343, wherein the concentration of the analyte in the phase linearly correlates with the change of intensity between the second surface plasmon intensity and the first surface plasmon intensity.

350. (Previously presented) A sensor comprising:

a first structure comprising a substantially transparent substrate and a plurality of metallic islands deposited onto the transparent substrate;

the metallic islands comprising metallic films having a thickness of no more than 10 nm, the thickness of the metallic films being such that upon binding of a substance to the first structure in electromagnetic radiation transmitted through the first structure and the substance a change in a localized surface plasmon intensity in the metallic films can be detected by correlating the change in the localized surface plasmon intensity with a change in spectra of the electromagnetic radiation transmitted through the first structure and the substance.

351. (Previously presented) The sensor of Claim 350, wherein the metallic films are made of Au or Ag.

352. (Previously presented) The sensor of Claim 350, wherein correlating the change in the plasmon intensity with a change in the spectra occurs at a single wavelength λ.

353. (Previously presented) The method of Claim 350, wherein the electromagnetic radiation is UV, infrared or visible radiation.

354. (Previously presented) A sensor comprising:

a first structure comprising a substantially transparent substrate and a plurality of metallic islands deposited onto the transparent substrate;

the metallic islands comprising metallic films having a thickness of no more than 10 nm and a layer bound to the metallic films, the thickness of the metallic films being such that upon binding of a substance to the layer of the first structure in electromagnetic radiation transmitted through the first structure, the layer and the substance a change in a localized surface plasmon intensity in the metallic films can be detected by correlating the change in the localized surface plasmon intensity with a change in spectra of the electromagnetic radiation transmitted through the first structure, the layer and the substance.

355. (Previously presented) The sensor of Claim 354, wherein the metallic films are made of Au or Ag.

356. (Previously presented) The sensor of Claim 354, wherein correlating the change in the plasmon intensity with a change in the spectra occurs at a single wavelength λ.

357. (Previously presented) The method of Claim 354, wherein the electromagnetic radiation is UV, infrared or visible radiation.

358. (Previously presented) The method of Claim 354, wherein the layer has specific affinity to the substance.

359. (Previously presented) The method of Claim 354, wherein the change in the localized surface plasmon intensity linearly correlates with a change in spectra of the electromagnetic radiation transmitted through the first structure, the layer and the substance.

360. (Previously presented) A sensing system comprising:

a sensor comprising a first structure comprising a substantially transparent substrate, a plurality of metallic islands deposited onto the transparent substrate, and a layer deposited onto the metallic islands;

a source for generating electromagnetic radiation;

an adsorption enabling element serving to bring an analyte in contact with the sensor;

a detector for detecting a spectral change in the electromagnetic radiation transmitted through the sensor, the spectral change in the transmitted electromagnetic radiation correlating with a change in a localized surface plasmon intensity in the metallic islands, the change in the localized surface plasmon intensity occurring due to adsorption or desorption of the analyte onto the layer deposited onto the metallic islands.

361. (Previously presented) The system of Claim 360, further comprising a processor coupled to the detector, the processor serving to receive data from the detector and perform qualitative and/or quantitative sensing of the absorption or desorption of the analyte.

362. (Previously presented) The system of Claim 360, wherein the analyte is a chemical substance or a biological substance.

363. (Previously presented) The system of Claim 360, wherein the adsorption enabling element further comprises a flow cell for contacting the sensor by the analyte.

364. (Previously presented) The system of Claim 360, wherein the electromagnetic radiation is UV, infrared or visible radiation.

365. (Previously presented) The system of Claim 360, wherein the plurality of metallic islands comprises metallic films of a thickness not exceeding 10 nm.

366. (Previously presented) The system of Claim 360, wherein the metallic films are made of Au or Ag.

367. (Previously presented) The system of Claim 360, wherein the analyte is in a liquid or gaseous phase.

368. (Previously presented) A kit for analysis comprising:

a sensor comprising a substantially transparent substrate, a plurality of metallic islands deposited onto the transparent substrate, and a binding layer deposited onto the metallic islands;

a source for generating electromagnetic radiation;

an adsorption enabling element serving to bring a phase in contact with the binding layer;

a detector for detecting a spectral change in the electromagnetic radiation transmitted through the sensor, the spectral change in the transmitted electromagnetic radiation correlating with a change in a localized surface plasmon intensity in the metallic islands, the change in the localized surface plasmon intensity occurring due to binding of an analyte having specific affinity to the binding layer; and

means for providing qualitative or quantitative information about the presence or absence of the analyte in the phase.

369. (Previously presented) The kit of Claim 368, wherein the phase can be liquid or gaseous.

370. (Previously presented) The kit of Claim 368, further comprising a processor coupled to the detector and to the means for providing, the processor serving to

receive data from the detector and perform qualitative and/or quantitative sensing of binding of the analyte.

371. (Previously presented) The kit of Claim 368, wherein the information about the presence or absence of the analyte in the phase comprises information about a concentration of the analyte, kinetics of a chemical reaction involving the analyte.

372. (Previously presented) The system of Claim 368, wherein the analyte is a chemical substance or a biological substance.

373. (Previously presented) The system of Claim 368, wherein the adsorption enabling element further comprises a flow cell for contacting the sensor by the phase.

374. (Previously presented) The system of Claim 368, wherein the electromagnetic radiation is UV, infrared or visible radiation.

375. (Previously presented) The system of Claim 368, wherein the plurality of metallic islands comprises metallic films of a thickness not exceeding 10 nm.

376. (Previously presented) The system of Claim 368, wherein the metallic films are made of Au or Ag.